Model Name: T546QB01 V0

Issue Date : 2011/12/06

( ) Preliminary Specifications
(∗)Final Specifications

Customer Signature	Date	AUO	Date
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Note		Reviewed By RD Director Eugene Chen 2011 12/7	
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Contents

Record of Revision

Version	Date	Page	Description
0.0	2011/08/12		First release
1.0	2011/09/27	P19 ~ P21	Add 3D OPTICAL SPECIFICATION
2.0	2011/11/01	P4	Modify **General Information**
		P7	Modify Interface Connections
		P16	Modify LED driver condition
		P19 ~ P21	Modify 3D optical
		P26	**Modify the drawing of front view**
3.0	2011/11/07	P6	Modify 3.1.1: DC Characteristics
4.0	2011/11/13	P6~P52	Modify Product Specification
5.0	2011/12/03	P30~P31	Modify 3D optical
6.0	2011/12/06	P4 , P38	Modify **General Information and RA test**
7.0	2012/2/16		Power Sequence modification

1. General Description

This specification applies to the 55 inch Color TFT-LCD Module T546QB01 V0. This LCD module has a TFT active matrix type liquid crystal 3,840*2,160 panel pixels, and diagonal size of 55 inch. This module supports 3,840*2,160 mode. Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with a 10-bit gray scale signal for each dot.

The T546QB01 V0 has been designed to apply the 10-bit , 16ch V by one interface method. It is intended to support displays where high brightness, wide viewing angle, high color saturation, and high color depth are very important. Also, 3D function is also embedded into front glass.

*** General Information**

Items	Specification	Unit	Note
Active Screen Size	55	inch	
Display Area	1209.6(H) x 680.4(V)	mm	
Outline Dimension	1,241.6 (H) x 724.4 (V) x 30.8 (D)	mm	w/o cover
Driver Element	a-Si TFT active matrix		
Bezel Opening	1217.6(H)X688.4(V)	mm	
Display Colors	10 bit,	Colors	
Number of Pixels	3840 x 2160	Pixel	
Pixel Pitch	0.315(H) x 0.315(W)	mm	
Pixel Arrangement	RGB vertical stripe		
Display Operation Mode	Normally Black		
Rotate Function	Unachievable		Note 1
Display Orientation	Signal input with “A”		Note 2

Note 1: Rotate Function refers to LCD display could be able to rotate.

Note 2: LCD display as below illustrated when signal input with “A”.

2. Absolute Maximum Ratings

The followings are maximum values which, if exceeded, may cause faulty operation or damage to the unit

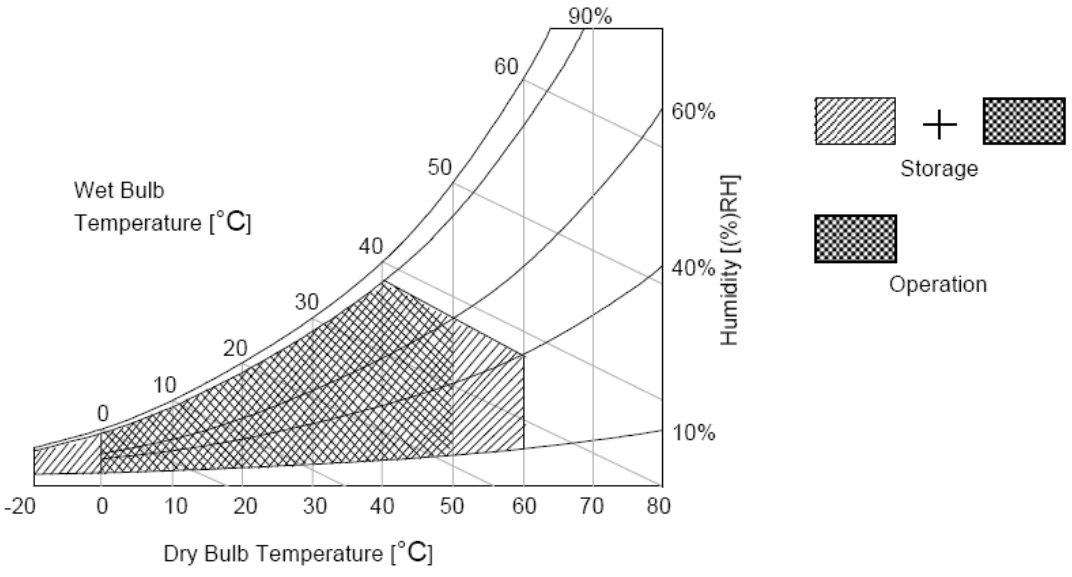
Item	Symbol	Min	Max	Unit	Conditions
Logic/LCD Drive Voltage (for 12V input)	Vcc	-0.3	14	[Volt]	Note 1
Logic/LCD Drive Voltage (for 5V input)	Vcc			[Volt]	Note 1
Input Voltage of Signal (for 12V input)	Vin	-0.3	3.6	[Volt]	Note 1
Input Voltage of Signal (for 5V input)	Vin			[Volt]	Note 1
Operating Temperature	TOP	0	+50	[°C]	Note 2
Operating Humidity	HOP	10	90	[%RH]	Note 2
Storage Temperature	TST	-20	+60	[°C]	Note 2
Storage Humidity	HST	10	90	[%RH]	Note 2
Panel Surface Temperature	PST	-	65	[°C]	Note 3

Note 1: Duration:50 msec.

Note 2 : Maximum Wet-Bulb should be 39℃ and No condensation.

The relative humidity must not exceed 90% non-condensing at temperatures of 40℃ or less. At temperatures greater than 40℃, the wet bulb temperature must not exceed 39℃.

Note 3: Surface temperature is measured at 50℃ Dry condition



3. Electrical Specification

The T546QB01 V0 requires two power inputs. One is employed to power the LCD electronics and to drive the TFT array and liquid crystal. The other is to power Back Light Unit.

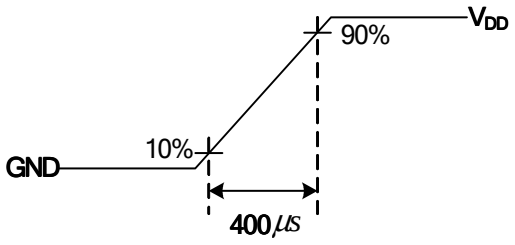
3.1 Electrical Characteristics

3.1.1: DC Characteristics

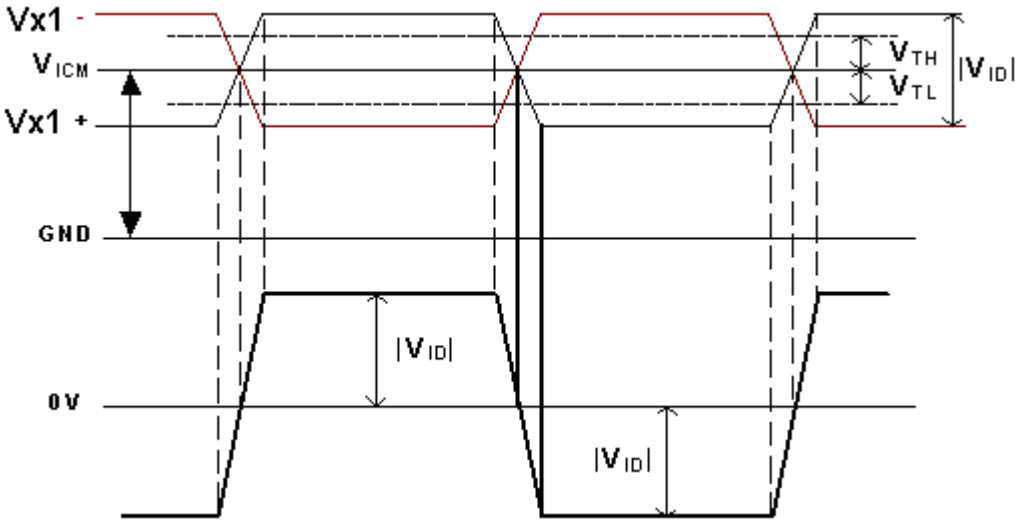
Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max		
LCD							
Power Supply Input Voltage (for input power=12V)		V_{DD}	10.8	12	13.2	V_{DC}	
Power Supply Input Current (Define to section:1.1)		I_{DD}	--	1.9	4.5	A	1
Power Consumption (Define to section:1.1)		P_C	--	22.8	54	Watt	1
Inrush Current (Define to section:1.1)		I_{RUSH}	--	--	4	A	2
V by One Interface	Input Differential Voltage	$\lvert V_{ID} \rvert$	100			mV_{DC}	3
	Differential Input High Threshold Voltage	V_{TH}	+50			mV_{DC}	3
	Differential Input Low Threshold Voltage	V_{TL}			-50	mV_{DC}	3
	Input Common Mode Voltage	V_{ICM}		0.82		V_{DC}	3
CMOS Interface	Input High Threshold Voltage	V_{IH} (High)	2.4	--	3.3	V_{DC}	4
	Input Low Threshold Voltage	V_{IL} (Low)	0	--	0.6	V_{DC}	4
Backlight Power Consumption(Refer to Section: 3.7)		P_{BL}		150		Watt	
Life time (MTTF)			30000			Hour	5,6

Note :

1. V_{DD} = 12.0V, Fv = 120Hz, Fclk= 78.125MHz , 25 ℃, Test Pattern : White Pattern
   >> refer to “Section:3.3 Signal Timing Specification, Typical timing”
2. Measurement condition : Rising time = 400us



3. V_{ICM} = 0.82V



4. The measure points of V_{IH} and V_{IL} are in LCM side after connecting the System Board and LCM.
5. The relative humidity must not exceed 80% non-condensing at temperatures of 40℃ or less. At temperatures greater than 40℃, the wet bulb temperature must not exceed 39℃. When operate at low temperatures, the brightness of LED will drop and the life time of LED will be reduced.
6. The lifetime (MTTF) is defined as the time which luminance of LED is 50% compared to its original value. [Operating condition: Continuous operating at Ta = 25±2℃]

3.2 Interface Connections

- LCD V by One connector:

  V by One CN (41Pin) : FI-RE41S-HF (JAE)

PIN	Symbol	Description	PIN	Symbol	Description
1	GND	Ground	21	Rx11n	V-by-One HS Data Lane 11
2	GND	Ground	22	Rx11p	V-by-One HS Data Lane 11
3	GND	Ground	23	GND	CML Ground
4	GND	Ground	24	GND	CML Ground
5	GND	Ground	25	Rx12n	V-by-One HS Data Lane 12
6	SCL	I2C CLK	26	Rx12p	V-by-One HS Data Lane 12
7	SDA	I2C Data	27	GND	CML Ground
8	GND	CML Ground	28	GND	CML Ground
9	Rx8n	V-by-One HS Data Lane 8	29	Rx13n	V-by-One HS Data Lane 13
10	Rx8p	V-by-One HS Data Lane 8	30	Rx13p	V-by-One HS Data Lane 13
11	GND	CML Ground	31	GND	CML Ground
12	GND	CML Ground	32	GND	CML Ground
13	Rx9n	V-by-One HS Data Lane 9	33	Rx14n	V-by-One HS Data Lane 14
14	Rx9p	V-by-One HS Data Lane 9	34	Rx14p	V-by-One HS Data Lane 14
15	GND	CML Ground	35	GND	CML Ground
16	GND	CML Ground	36	GND	CML Ground
17	Rx10n	V-by-One HS Data Lane 10	37	Rx15n	V-by-One HS Data Lane 15
18	Rx10p	V-by-One HS Data Lane 10	38	Rx15p	V-by-One HS Data Lane 15
19	GND	CML Ground	39	GND	CML Ground
20	GND	CML Ground	40	NC	AUO Internal Use Only
			41	GND	Ground

V by One CN (51Pin) : FI-RE51S-HF (JAE)

PIN	Symbol	Description	PIN	Symbol	Description
1	NC	NC PIN	26	GND	CML Ground
2	NC	NC PIN	27	Rx2n	V-by-One HS Data Lane 2
3	NC	AUO Internal Use Only	28	Rx2p	V-by-One HS Data Lane 2
4	NC	NC PIN	29	GND	CML Ground
5	NC	NC PIN	30	GND	CML Ground
6	NC	NC PIN	31	Rx3n	V-by-One HS Data Lane 3
7	NC	NC PIN	32	Rx3p	V-by-One HS Data Lane 3
8	NC	NC PIN	33	GND	CML Ground
9	NC	AUO Internal Use Only	34	GND	CML Ground
10	NC	NC PIN	35	Rx4n	V-by-One HS Data Lane 4
11	GND	Ground	36	Rx4p	V-by-One HS Data Lane 4
12	GND	Ground	37	GND	CML Ground
13	GND	Ground	38	GND	CML Ground
14	GND	Ground	39	Rx5n	V-by-One HS Data Lane 5
15	GND	Ground	40	Rx5p	V-by-One HS Data Lane 5
16	HTPDN	Hot plug detect	41	GND	CML Ground
17	LOCKN	Lock detect	42	GND	CML Ground
18	GND	CML Ground	43	Rx6n	V-by-One HS Data Lane 6
19	Rx0n	V-by-One HS Data Lane 0	44	Rx6p	V-by-One HS Data Lane 6
20	Rx0p	V-by-One HS Data Lane 0	45	GND	CML Ground
21	GND	CML Ground	46	GND	CML Ground
22	GND	CML Ground	47	Rx7n	V-by-One HS Data Lane 7
23	Rx1n	V-by-One HS Data Lane 1	48	Rx7p	V-by-One HS Data Lane 7
24	Rx1p	V-by-One HS Data Lane 1	49	GND	CML Ground
25	GND	CML Ground	50	NC	AUO Internal Use Only
			51	SYNC3D_I	3D Sync. In Flag (Glasses type)

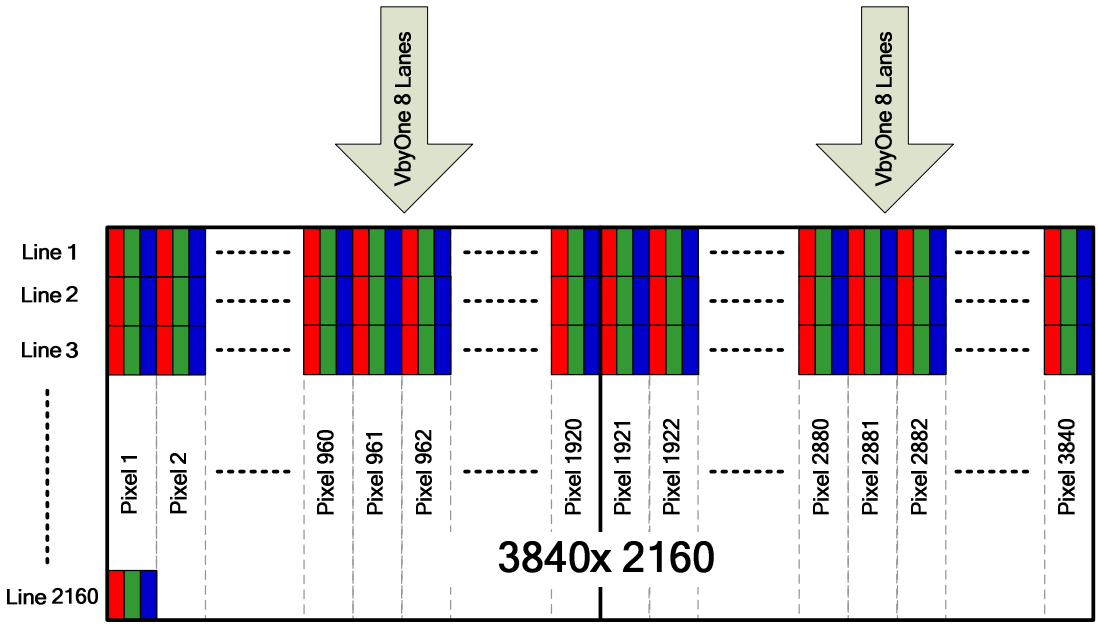
- LCD Power connector:

  Power CN (12Pin) : A2010WR0-12PS-SHP (JWT)

PIN	Symbol	Description
1	PWR Power V12 IN	PWR Power V12 IN
2	PWR Power V12 IN	PWR Power V12 IN
3	PWR Power V12 IN	PWR Power V12 IN
4	PWR Power V12 IN	PWR Power V12 IN
5	PWR Power V12 IN	PWR Power V12 IN
6	NC	NC PIN
7	NC	NC PIN
8	GND Ground	GND Ground
9	GND Ground	GND Ground
10	GND Ground	GND Ground
11	GND Ground	GND Ground
12	GND Ground	GND Ground

4K2K Input Data Format:

2D Mode:

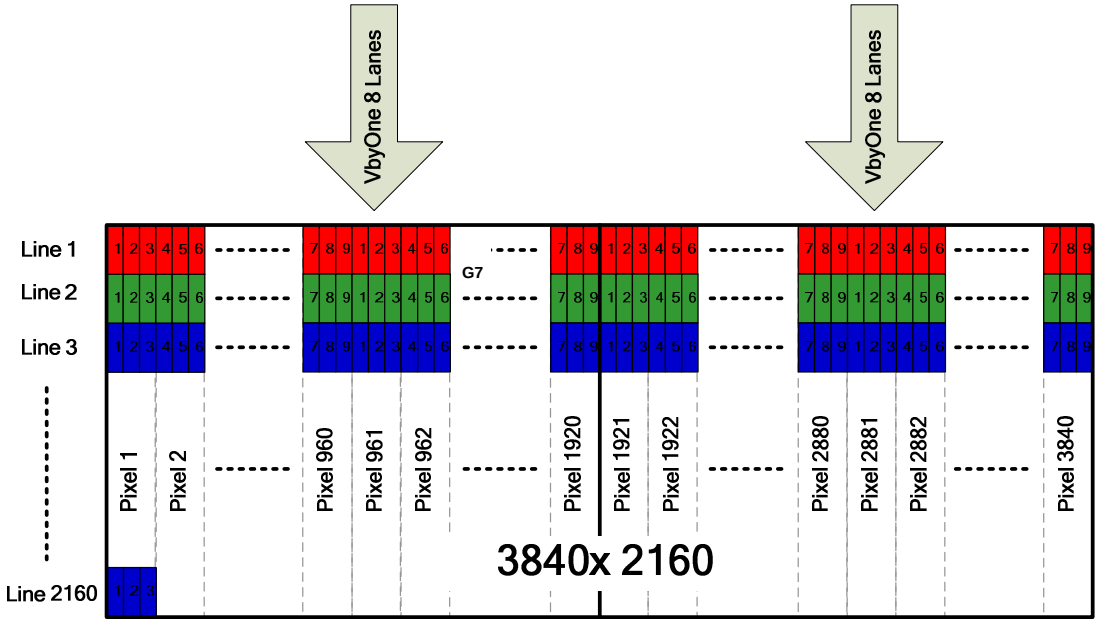


Note: Normal pixel data mapping

2D Mode Pixel Mapping:

Pixel No	Pixel 1			Pixel 2			Pixel 3			~		Pixel 3840		
Line 1	R1	G1	B1	R2	G2	B2	R3	G3	B3	R4	~	R3840	G3840	B3840
Line 2	R1	G1	B1	R2	G2	B2	R3	G3	B3	R4	~	R3840	G3840	B3840
Line 3	R1	G1	B1	R2	G2	B2	R3	G3	B3	R4	~	R3840	G3840	B3840
Line 4	R1	G1	B1	R2	G2	B2	R3	G3	B3	R4	~	R3840	G3840	B3840
Line 5	R1	G1	B1	R2	G2	B2	R3	G3	B3	R4	~	R3840	G3840	B3840
Line 6	R1	G1	B1	R2	G2	B2	R3	G3	B3	R4	~	R3840	G3840	B3840
:	:	:	:	:	:	:	:	:	:	:	~	:	:	:
Line 2158	R1	G1	B1	R2	G2	B2	R3	G3	B3	R4	~	R3840	G3840	B3840
Line 2159	R1	G1	B1	R2	G2	B2	R3	G3	B3	R4	~	R3840	G3840	B3840
Line 2160	R1	G1	B1	R2	G2	B2	R3	G3	B3	R4	~	R3840	G3840	B3840

3D Mode (9-View)



Note: 3D multi-view data mapping (1,2,3,4,5,6,7,8,9 is the viewing number)

3D Mode Pixel Mapping:

	Pixel No.	Pixel 1			Pixel 2			Pixel 3			~		Pixel 3840		
	View #	1	2	3	4	5	6	7	8	9	1	~	7	8	9
Line 1	Multi-view Line 1	R1	R1	R1	R1	R1	R1	R1	R1	R1	R2	~	R1280	R1280	R1280
Line 2		G1	G1	G1	G1	G1	G1	G1	G1	G1	G2	~	G1280	G1280	G1280
Line 3		B1	B1	B1	B1	B1	B1	B1	B1	B1	B2	~	B1280	B1280	B1280
Line 4	Multi-view	R1	R1	R1	R1	R1	R1	R1	R1	R1	R2	~	R1280	R1280	R1280

Line 5	**Line 2**	G1	G1	G1	G1	G1	G1	G1	G1	G1	G2	~	G1280	G1280	G1280
Line 6		B1	B1	B1	B1	B1	B1	B1	B1	B1	B2	~	B1280	B1280	B1280
:	**:**	:	:	:	:	:	:	:	:	:	:	~	:	:	:
Line 2158	**Multi-view Line 720**	R1	R1	R1	R1	R1	R1	R1	R1	R1	R2	~	R1280	R1280	R1280
Line 2159		G1	G1	G1	G1	G1	G1	G1	G1	G1	G2	~	G1280	G1280	G1280
Line 2160		B1	B1	B1	B1	B1	B1	B1	B1	B1	B2	~	B1280	B1280	B1280

V-by-One Lanes of Pixel Data :

	Lane 0	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7
Blank	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS
	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP
	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR
Line 1	Pixel 1	Pixel 2	Pixel 3	Pixel 4	Pixel 5	Pixel 6	Pixel 7	Pixel 8
	Pixel 9	Pixel 10	Pixel 11	Pixel 12	Pixel 13	Pixel 14	Pixel 15	Pixel 16
	.	.	.	.	.	.	.	.
	Pixel 1913	Pixel 1914	Pixel 1915	Pixel 1916	Pixel 1917	Pixel 1918	Pixel 19198	Pixel 1920
Blank	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS
	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP
	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR
Line2	Pixel 1	Pixel 2	Pixel 3	Pixel 4	Pixel 5	Pixel 6	Pixel 7	Pixel 8
	Pixel 8	Pixel 10	Pixel 11	Pixel 12	Pixel 13	Pixel 14	Pixel 15	Pixel 16
	.	.	.	.	.	.	.	.
	Pixel 1913	Pixel 1914	Pixel 1915	Pixel 1916	Pixel 1917	Pixel 1918	Pixel 19198	Pixel 1920
.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.

	Lane 8	Lane 9	Lane 10	Lane 11	Lane 12	Lane 13	Lane 14	Lane 15
Blank	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS
	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP
	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR
Line 1	Pixel 1921	Pixel 1922	Pixel 1923	Pixel 1924	Pixel 1925	Pixel 1926	Pixel 1927	Pixel 1928
	Pixel 1929	Pixel 1930	Pixel 1931	Pixel 1932	Pixel 1933	Pixel 1934	Pixel 1935	Pixel 1936
	.	.	.	.	.	.	.	.
	Pixel 3833	Pixel 3834	Pixel 3835	Pixel 3836	Pixel 3837	Pixel 3838	Pixel 3839	Pixel 3840
Blank	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS
	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP
	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR
Line2	Pixel 1921	Pixel 1922	Pixel 1923	Pixel 1924	Pixel 1925	Pixel 1926	Pixel 1927	Pixel 1928
	Pixel 1929	Pixel 1930	Pixel 1931	Pixel 1932	Pixel 1933	Pixel 1934	Pixel 1935	Pixel 1936
	.	.	.	.	.	.	.	.
	Pixel 3833	Pixel 3834	Pixel 3835	Pixel 3836	Pixel 3837	Pixel 3838	Pixel 3839	Pixel 3840
.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.

3.3 Signal Timing Specification

This is the signal timing required at the input of the user connector. All of the interface signal timing should be satisfied with the following specifications for its proper operation.

4K2K (3840x2160) V-by-One Each Lane Timing Spec. (240x2160 @120Hz x16Lanes)

Type	Item	Symbol	Min	Typ	Max	Unit
Vertical Section	Period	Tv	2172	2200	2244	Th
	Active	Tdisp(v)		2160		Th
	Blanking	Tblk(v)	12	40	84	Th
Horizontal Section	Period	Th	280	290	300	Tclk
	Active	Tdisp(h)		240		Tclk
	Blanking	Tblk(h)	40	50	60	Tclk
Frequency	Clock	Tclk		76.48	78.125	MHz

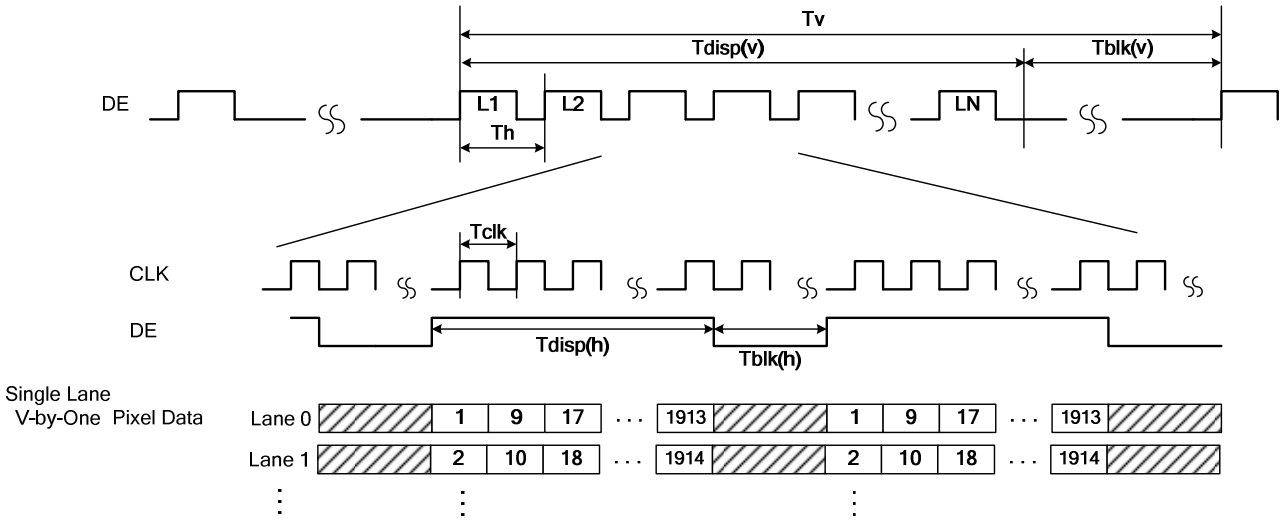
4K2K (3840x2160) V-by-One Each Lane Timing Spec. (240x2160 @100Hz x16Lanes)

Type	Item	Symbol	Min	Typ	Max	Unit
Vertical Section	Period	Tv	2172	2200	2692	Th
	Active	Tdisp(v)		2160		Th
	Blanking	Tblk(v)	12	40	532	Th
Horizontal Section	Period	Th	280	290	354	Tclk
	Active	Tdisp(h)		240		Tclk
	Blanking	Tblk(h)	40	50	114	Tclk
Frequency	Clock	Tclk		76.48	78.125	MHz

4K2K V-by-One 2area (1920x2160) Timing difference

Type	Item	Symbol	Min	Typ	Max	Unit
2Area Latency	Difference	Tdiff	-1	0	1	Th

3.4 Signal Timing Waveforms



3.5 Color Input Data Reference

The brightness of each primary color (red, green and blue) is based on the 10 bit gray scale data input for the color; the higher the binary input, the brighter the color. The table below provides a reference for color versus data input.

COLOR DATA REFERENCE

Color		Input Color Data																													
		RED (MSB … LSB)										GREEN (MSB … LSB)										BLUE (MSB … LSB)									
		R9	R8	R7	R6	R5	R4	R3	R2	R1	R0	G9	G8	G7	G6	G5	G4	G3	G2	G1	G0	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
Basic Color	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(1023)	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(1023)	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
	Blue(1023)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
R	RED(000)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(001)	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

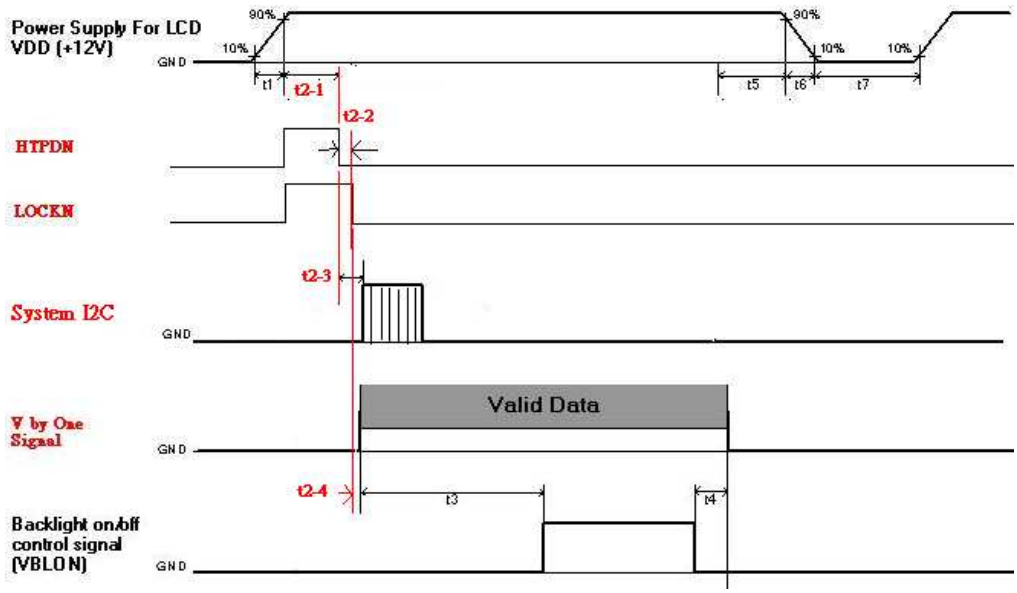
	RED(1022)	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	RED(1023)	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	GREEN(000)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(001)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

	GREEN(1022)	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(1023)	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
B	BLUE(000)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BLUE(001)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

	BLUE(1022)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0
	BLUE(1023)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1

3.6 Power Sequence for LCD



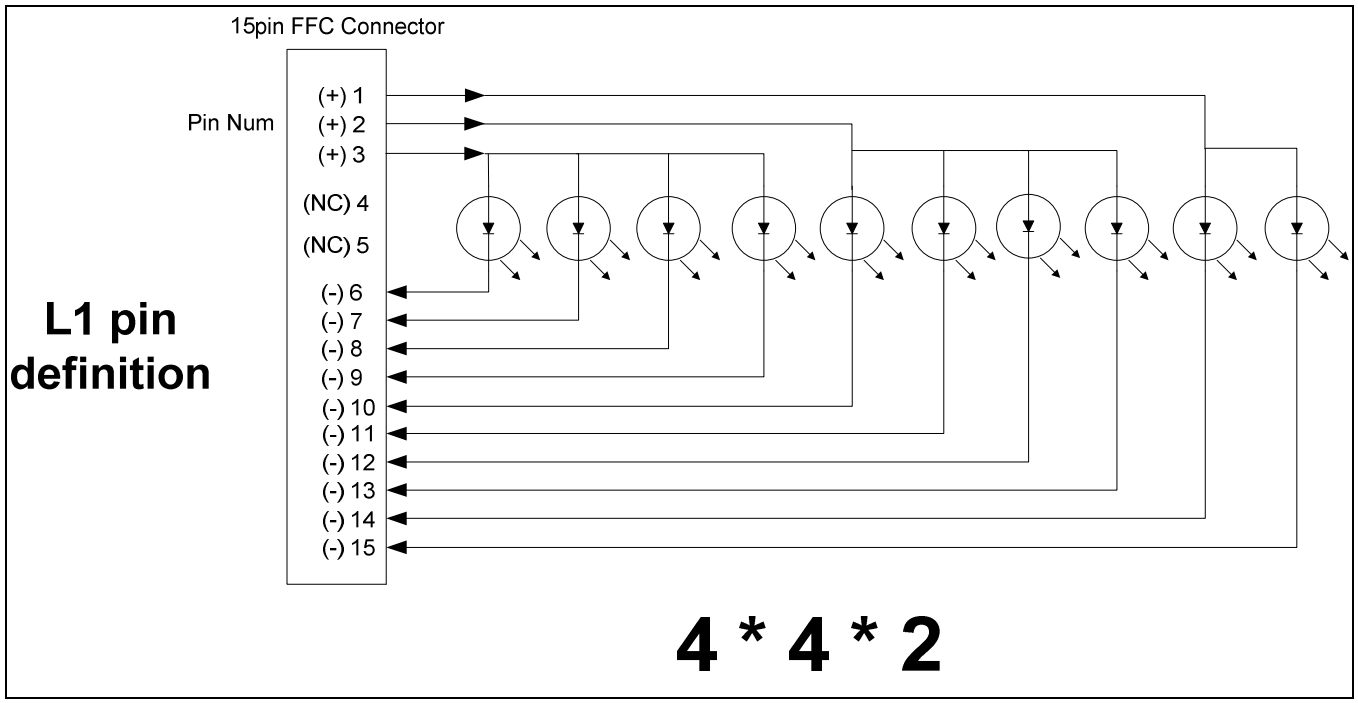
Parameter	Values			Unit
	Min.	Type.	Max.	
t1	0.4	--	30	ms
t2-1	1145	--	3580	ms
t2-2	--	--	--*1	ms
t2-3	60	--	--	ms
t2-4			1	ms
t3	1330	--	--	ms
t4	0*2	--	--	ms
t5	0	--	--	ms
t6	--	--	--*3	ms
t7	500	--	--	ms

Note:
(1) t2-1 : V by One training time after power-on. The timing of HTPDN falling edge to LOCKN falling edge decided by customer system.
(2) t4=0 : concern for residual pattern before BLU turn off.
(3) t6 : voltage of VDD must decay smoothly after power-off. (Customer system decide this value)

3.7 Backlight Specification (without driver board)

3.7.1 Light bar Driven Condition

Parameter		Symbol	Values			Unit	Note
			Min	Typ	Max		
Forward Current	Anode	IF (anode)		240	400	mA	
(one light bar)	Cathode	IF (cathode)		60	100	mA	
Peak Forward Current		IFP			120	mA	<1msec Per LED.
Forward Voltage		VF	9.5	10.4	11.6	V	
Forward Voltage Variation		▵VF			1.8	V	
Total Power Consumption (4 light bars)		PBL	136.8	149.8	167.0	W	



Note 1: Low dimming ratio operation
When PWM dimming duty ratio is operated lower than recommended value, feedback signal and all protection functions should be confirmed by LIPS design. Display performance should also be confirmed by customer's implement.

Note 2: Each LED string should be driven by independent current control/feedback circuit.

Note 3: Fuse protection should be added into LIPS circuit to have better LED driving protection.

3.7.2 Input Pin Assignment

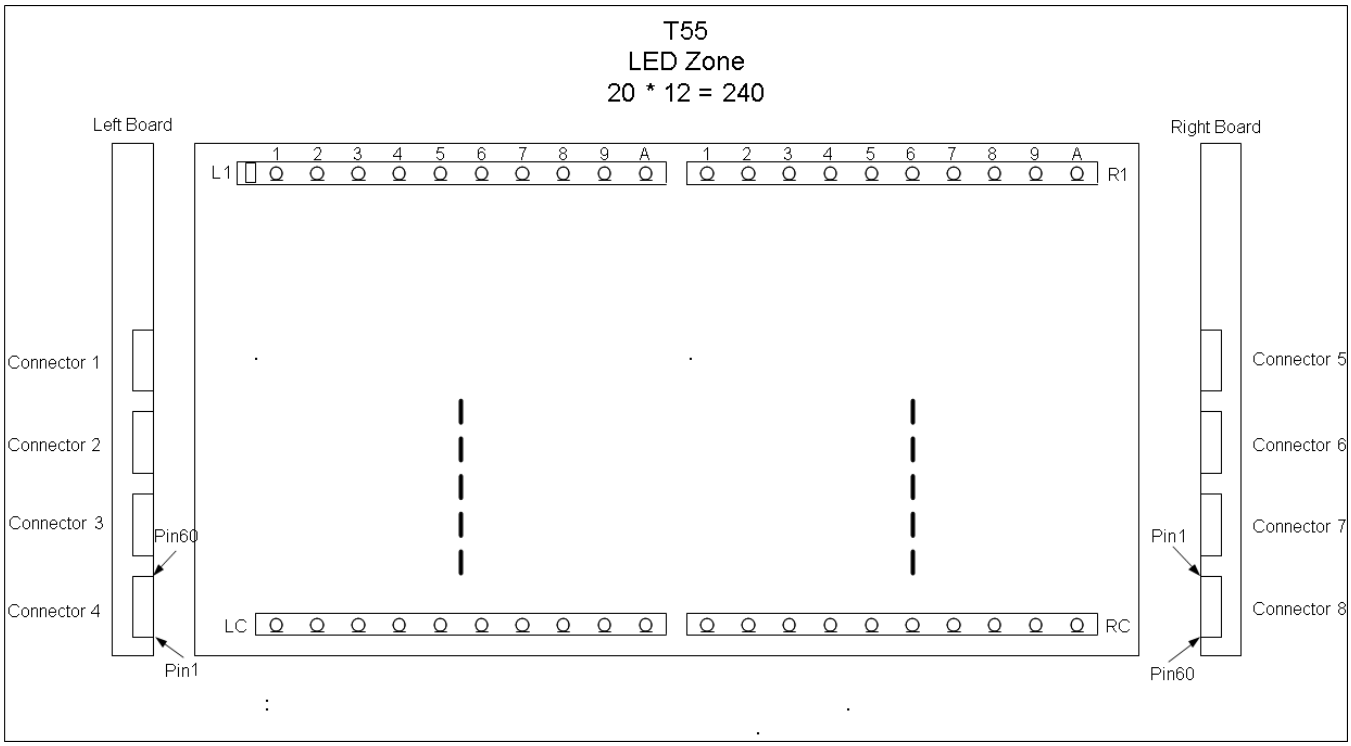
LED connector : P-two 196225-60041

Left Board

Right Board

Pin Number	Connector 1	Connector2	Connector 3	Connector 4
60	NC	NC	NC	NC
59	L1_+1	L4_+3	L73-	LA7
58	L1_+2	NC	L74-	LA8
57	L1_+2	L41-	L75-	LA9
56	L1_+3	L42-	L76-	LAA
55	L1_+3	L43-	L77-	NC
54	NC	L44-	L78-	NC
53	L11-	L45-	L79-	LB_+1
52	L12-	L46-	L7A-	LB_+2
51	L13-	L47-	NC	LB_+2
50	L14-	L48-	NC	LB_+3
49	L15-	L49-	L8_+1	LB_+3
48	L16-	L4A-	L8_+2	NC
47	L17-	NC	L8_+2	LB1
46	L18-	NC	L8_+3	LB2
45	L19-	L5_+1	L8_+3	LB3
44	L1A-	L5_+2	NC	LB4
43	NC	L5_+2	L81-	LB5
42	NC	L5_+3	L82-	LB6
41	L2_+1	L5_+3	L83-	LB7
40	L2_+2	NC	L84-	LB8
39	L2_+2	L51-	L85-	LB9
38	L2_+3	L52-	L86-	LBA
37	L2_+3	L53-	L87-	NC
36	NC	L54-	L88-	NC
35	L21-	L55-	L89-	LC_+1
34	L22-	L56-	L8A-	LC_+2
33	L23-	L57-	NC	LC_+2
32	L24-	L58-	NC	LC_+3
31	L25-	L59-	L9_+1	LC_+3
30	L26-	L5A-	L9_+2	NC
29	L27-	NC	L9_+2	LC1
28	L28-	NC	L9_+3	LC2
27	L29-	L6_+1	L9_+3	LC3
26	L2A-	L6_+2	NC	LC4
25	NC	L6_+2	L91-	LC5
24	NC	L6_+3	L92-	LC6
23	L3_+1	L6_+3	L93-	LC7
22	L3_+2	NC	L94-	LC8
21	L3_+2	L61-	L95-	LC9
20	L3_+3	L62-	L96-	LCA
19	L3_+3	L63-	L97-	NC
18	NC	L64-	L98-	NC
17	L31-	L65-	L99-	NC
16	L32-	L66-	L9A-	NC
15	L33-	L67-	NC	NC
14	L34-	L68-	NC	NC
13	L35-	L69-	LA_+1	NC
12	L36-	L6A-	LA_+2	NC
11	L37-	NC	LA_+2	NC
10	L38-	NC	LA_+3	NC
9	L39-	L7_+1	LA_+3	NC
8	L3A-	L7_+2	NC	NC
7	NC	L7_+2	LA1-	NC
6	NC	L7_+3	LA2-	NC
5	L4_+1	L7_+3	LA3-	NC
4	L4_+2	NC	LA4-	NC
3	L4_+2	L71-	LA5-	NC
2	L4_+3	L72-	LA6-	NC
1	NC	NC	NC	NC

Pin Number	Connector 5	Connector 6	Connector 7	Connector 8
1	NC	NC	NC	NC
2	R1A-	R46-	R72-	RA_+3
3	R19-	R45-	R71-	RA_+3
4	R18-	R44-	NC	RA_+2
5	R17-	R43-	R7_+3	RA_+2
6	R16-	R42-	R7_+3	RA_+1
7	R15-	R41-	R7_+2	NC
8	R14-	NC	R7_+2	NC
9	R13-	R4_+3	R7_+1	RBA-
10	R12-	R4_+3	NC	RB9-
11	R11-	R4_+2	NC	RB8-
12	NC	R4_+2	R8A-	RB7-
13	R1_+3	R4_+1	R89-	RB6-
14	R1_+3	NC	R88-	RB5-
15	R1_+2	NC	R87-	RB4-
16	R1_+2	R5A-	R86-	RB3-
17	R1_+1	R59-	R85-	RB2-
18	NC	R58-	R84-	RB1-
19	NC	R57-	R83-	NC
20	R2A-	R56-	R82-	RB_+3
21	R29-	R55-	R81-	RB_+3
22	R28-	R54-	NC	RB_+2
23	R27-	R53-	NC	RB_+2
24	R26-	R52-	R8_+3	RB_+1
25	R25-	R51-	R8_+3	NC
26	R24-	NC	R8_+2	NC
27	R23-	R5_+3	R8_+2	RCA-
28	R22-	R5_+3	R8_+1	RC9-
29	R21-	R5_+2	NC	RC8-
30	NC	R5_+2	NC	RC7-
31	R2_+3	R5_+1	R9A-	RC6-
32	R2_+3	NC	R99-	RC5-
33	R2_+2	NC	R98-	RC4-
34	R2_+2	R6A-	R97-	RC3-
35	R2_+1	R69-	R96-	RC2-
36	NC	R68-	R95-	RC1-
37	NC	R67-	R94-	NC
38	R3A-	R66-	R93-	RC_+3
39	R39-	R65-	R92-	RC_+3
40	R38-	R64-	R91-	RC_+2
41	R37-	R63-	NC	RC_+2
42	R36-	R62-	R9_+3	RC_+1
43	R35-	R61-	R9_+3	NC
44	R34-	NC	R9_+2	NC
45	R33-	R6_+3	R9_+2	NC
46	R32-	R6_+3	R9_+1	NC
47	R31-	R6_+2	NC	NC
48	NC	R6_+2	NC	NC
49	R3_+3	R6_+1	RAA-	NC
50	R3_+3	NC	RA9-	NC
51	R3_+2	NC	RA8-	NC
52	R3_+2	R7A-	RA7-	NC
53	R3_+1	R79-	RA6-	NC
54	NC	R78-	RA5-	NC
55	NC	R77-	RA4-	NC
56	R4A-	R76-	RA3-	NC
57	R49-	R75-	RA2-	NC
58	R48-	R74-	RA1-	NC
59	R47-	R73-	NC	NC
60	NC	NC	NC	NC

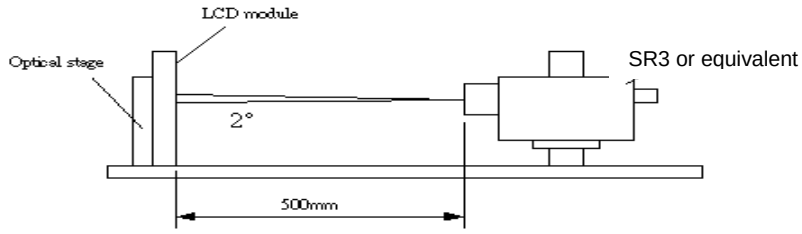


4. Optical Specification

4.1 2D Optical Specification

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 45 minutes in a dark environment at 25℃. The values specified are at an approximate distance 50cm from the LCD surface at a viewing angle of φ and θ equal to 0°.

Fig.1 presents additional information concerning the measurement equipment and method.



Parameter	Symbol	Values			Unit	Notes
		Min.	Typ.	Max		
Contrast Ratio	CR	4000	5000	--		1
Surface Luminance (White)	L_{WH} (2D)	360	450	--	cd/m^2	2
	L_{WH} (3D)		450			6
Luminance Variation	$\delta_{WHITE(9P)}$	--	--	1.3		3
Response Time (G to G)	Tγ	--	5.5	--	Ms	4
Color Gamut	NTSC		72		%	
Color Coordinates						

	Red	R_X	Typ.-0.03	0.640	Typ.+0.03		
		R_Y		0.330			
	Green	G_X		0.310			
		G_Y		0.620			
	Blue	B_X		0.150			
		B_Y		0.050			
	White	W_X		0.280			
		W_Y		0.290			
Viewing Angle							5
2D	x axis, right(φ=0°)	θ_r	--	89	--	degree	
	x axis, left(φ=180°)	θ_l	--	89	--	degree	
	y axis, up(φ=90°)	θ_u	--	89	--	degree	
	y axis, down (φ=270°)	θ_d	--	89	--	degree	

Note:

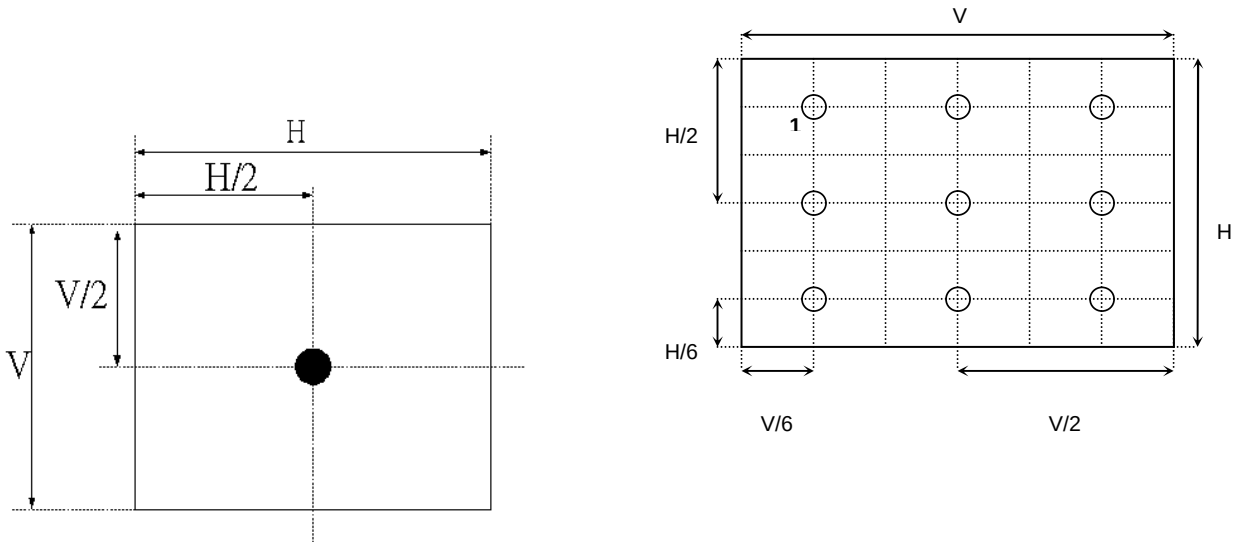
1. Contrast Ratio (CR) is defined mathematically as:

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance of } L_{on5}}{\text{Surface Luminance of } L_{off5}}$$

2. Surface luminance is luminance value at point 5 across the LCD surface 50cm from the surface with all pixels displaying white. From more information see FIG 2. When LED current I_F = typical value (without driver board),

LED input VDDB =24V, I_{DDB}. = Typical value (with driver board), L_{WH}=Lon5 where Lon5 is the luminance with all pixels displaying white at center 5 location.

FIG. 2 Luminance



3. The variation in surface luminance, δWHITE is defined (center of Screen) as:

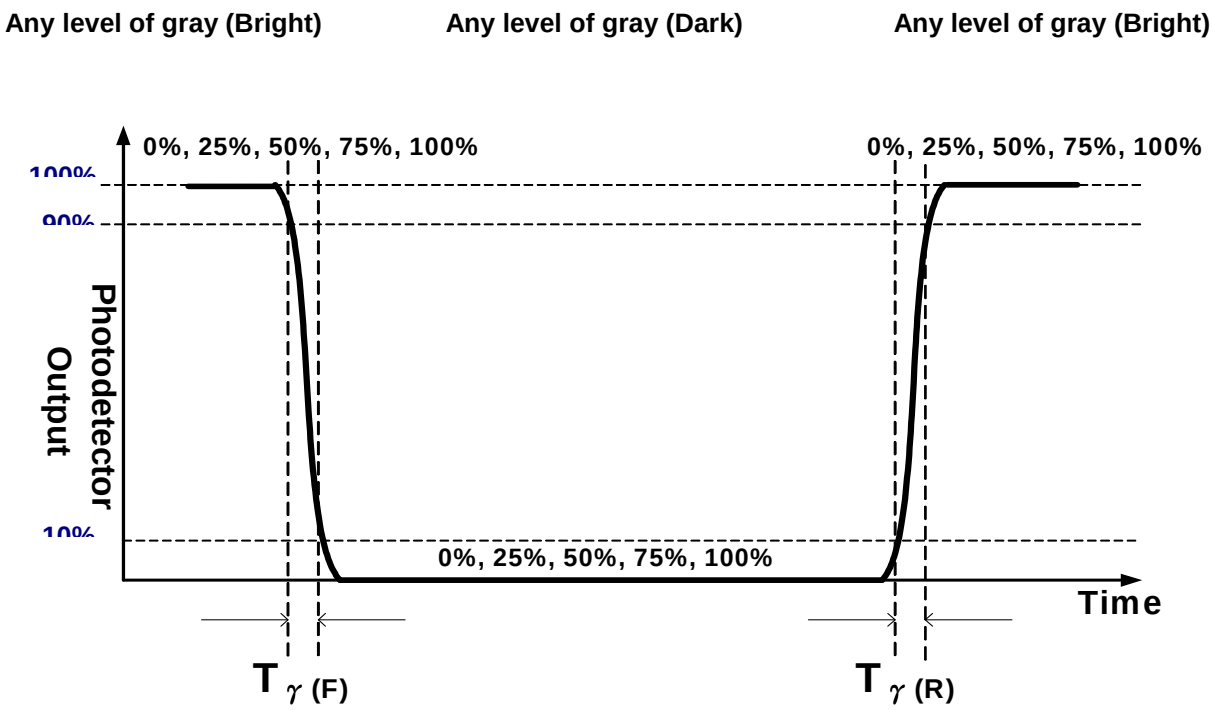
$\delta_{WHITE(9P)}$= Maximum(L_{on1}, L_{on2},…,L_{on9})/ Minimum(L_{on1}, L_{on2},…L_{on9})

4. Response time T_γ is the average time required for display transition by switching the input signal for five luminance ratio (0%,25%,50%,75%,100% brightness matrix) and is based on F_v=60Hz to optimize.

Measured Response Time		Target				
		0%	**25%**	**50%**	**75%**	**100%**
Start	**0%**		0% to 25%	0% to 50%	0% to 75%	0% to 100%
	25%	25% to 0%		25% to 50%	25% to 75%	25% to 100%
	50%	50% to 0%	50% to 25%		50% to 75%	50% to 100%
	75%	75% to 0%	75% to 25%	75% to 50%		75% to 100%
	100%	100% to 0%	100% to 25%	100% to 50%	100% to 75%	

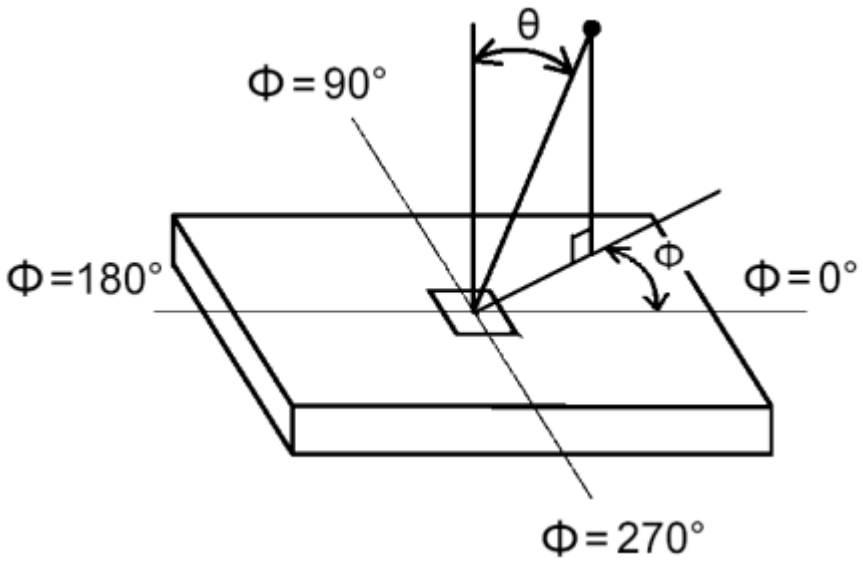
T_γ is determined by 10% to 90% brightness difference of rising or falling period. (As illustrated)

The response time is defined as the following figure and shall be measured by switching the input signal for “any level of grey(bright) “ and “any level of gray(dark)”.



5. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG3.

FIG.3 Viewing Angle



4.2 3D Optical Specification

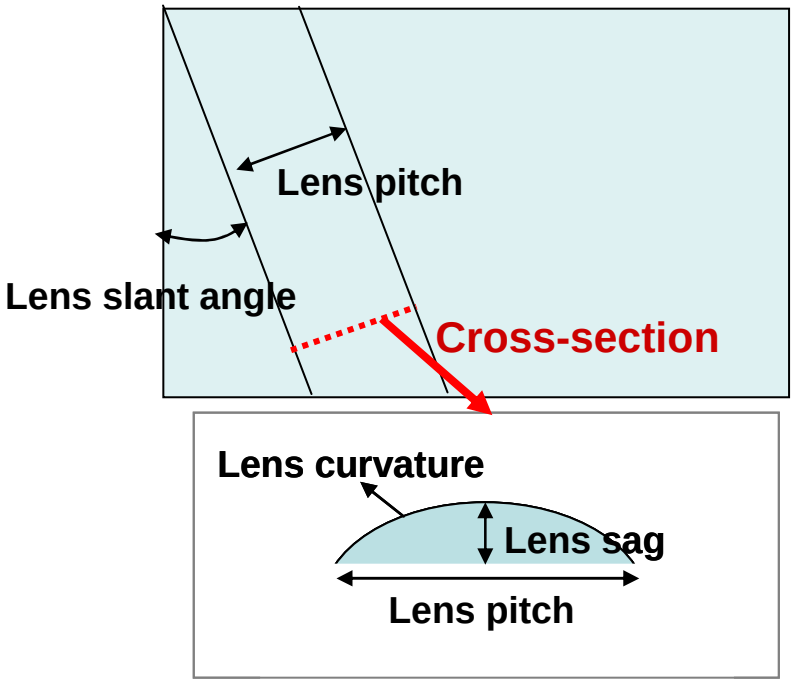
. 3D performance specification is expressed by 3D luminance, 3D Crosstalk and 3D viewing angle. 3D luminance which is defined by L255 in all 9 views and measured at panel center point. Also, 3D crosstalk is measured at panel center point

4-2-1 measurement items

No.	Evaluation Items	Unit	Definition	55"			Notes
				Min	Typ	Max	
1	Lens pitch	um	Fig.1	Typ-2.5	481.53	Typ+2.5	Incoming Inspection
2	Lens curvature	um	Fig.1	--	301.8	--	Incoming Inspection
3	Lens sag	um	Fig.1	Typ-2.0	119.8	Typ+2.0	Incoming Inspection
4	Lens slant angle	deg	Fig.1	Typ-0.3	9.7824	Typ+0.3	Incoming Inspection

5	Converging distance Original	m	After AUO calibration	--	2.2	--	Calibration

FIG.1 Lens structure

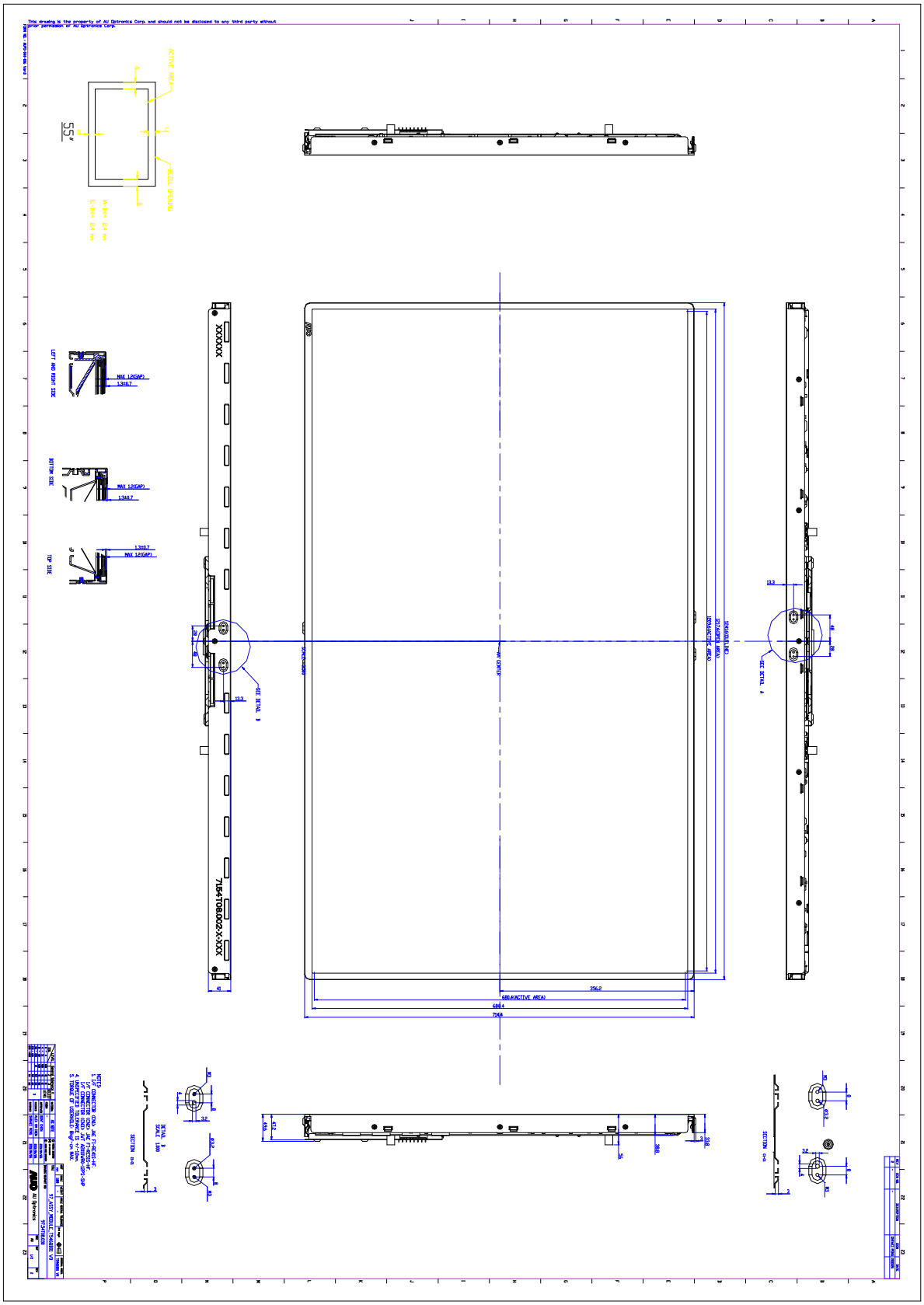


5. Mechanical Characteristics

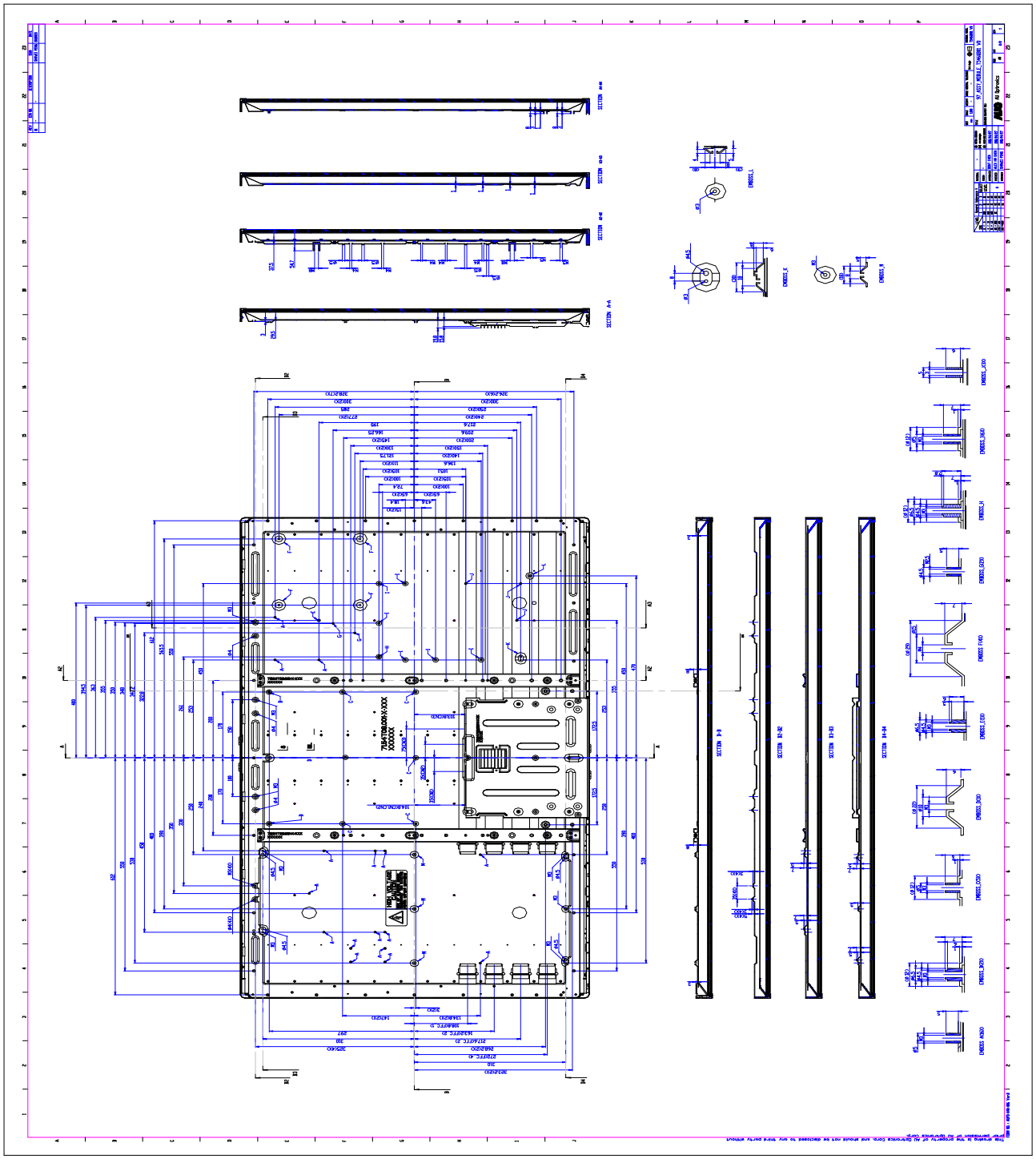
The contents provide general mechanical characteristics for the model T546QB01 V0. In addition the figures in the next page are detailed mechanical drawing of the LCD.

Item		Dimension	Unit	Note
Outline Dimension	Horizontal	1241.6	mm	
	Vertical	714.4	mm	
	Depth (Dmin)	30.8	mm	to rear
	Depth (Dmax)	56	mm	
Weight	16642		g	

Front View



Back View



6. Reliability Test Items

	Test Item	Q'ty	Condition
1	High temperature storage test	3	60℃, 300hrs
2	Low temperature storage test	3	-20℃, 300hrs
3	High temperature operation test	3	50℃, 300hrs
4	Low temperature operation test	3	-5℃, 300hrs
5	Vibration test (non-operation)	3	Wave form: random Vibration level : 1.0G RMS Bandwidth : 10-300Hz Duration : X,Y,Z 10min per axes X,Y,Z: Horizontal, face up
6	Shock test (non-operation)	3	Shock level 30G,11ms in ±X,Y,Z axis Waveform: half sine wave Direction: One time each direction
7	Vibration test (With carton)	5	Random wave (1.05Grms 10~200Hz) Duration : X,Y,Z 10min per axes
8	Drop test (With carton)	5	Height: 25.4cm (ASTMD4169-I) surround four flats, bottom flat two times (refer ASTM D 5276)

7. International Standard

7.1 Safety

(1) UL 60950-1, UL 60065; Standard for Safety of Information Technology Equipment Including electrical Business Equipment.

(2) IEC 60950-1 : 2001, IEC 60065:2001 ; Standard for Safety of International Electrotechnical Commission

(3) EN 60950 : 2001+A11, EN 60065:2002+A1:2006; European Committee for Electrotechnical Standardization (CENELEC), EUROPEAN STANDARD for Safety of Information Technology Equipment Including Electrical Business Equipment.

7.2 EMC

(1) ANSI C63.4 “Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electrical Equipment in the Range of 9kHz to 40GHz. “American National standards Institute(ANSI), 1992

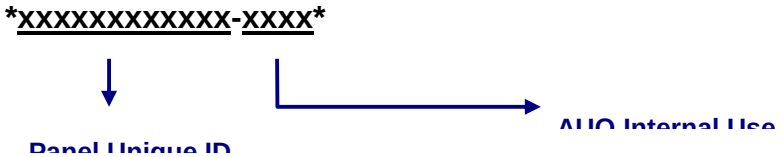
(2) C.I.S.P.R “Limits and Methods of Measurement of Radio Interface Characteristics of Information Technology Equipment.” International Special committee on Radio Interference.

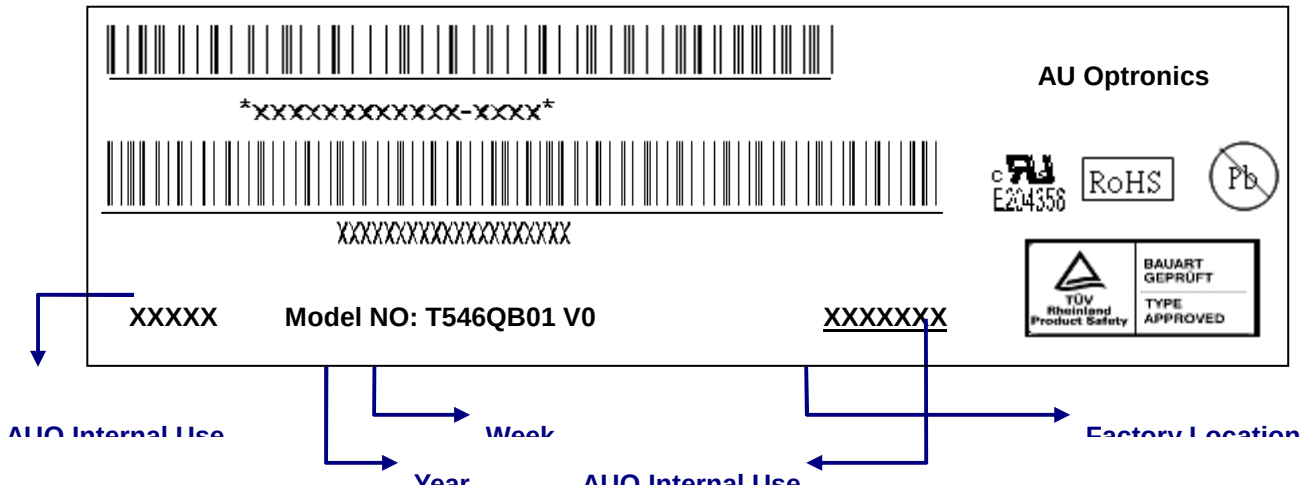
(3) EN 55022 “Limits and Methods of Measurement of Radio Interface Characteristics of Information Technology Equipment.” European Committee for Electrotechnical Standardization. (CENELEC), 1998

8. Packing

8-1 DEFINITION OF LABEL:

A. Panel Label:





Green mark description

(1) For Pb Free Product, AUO will add Pb for identification.

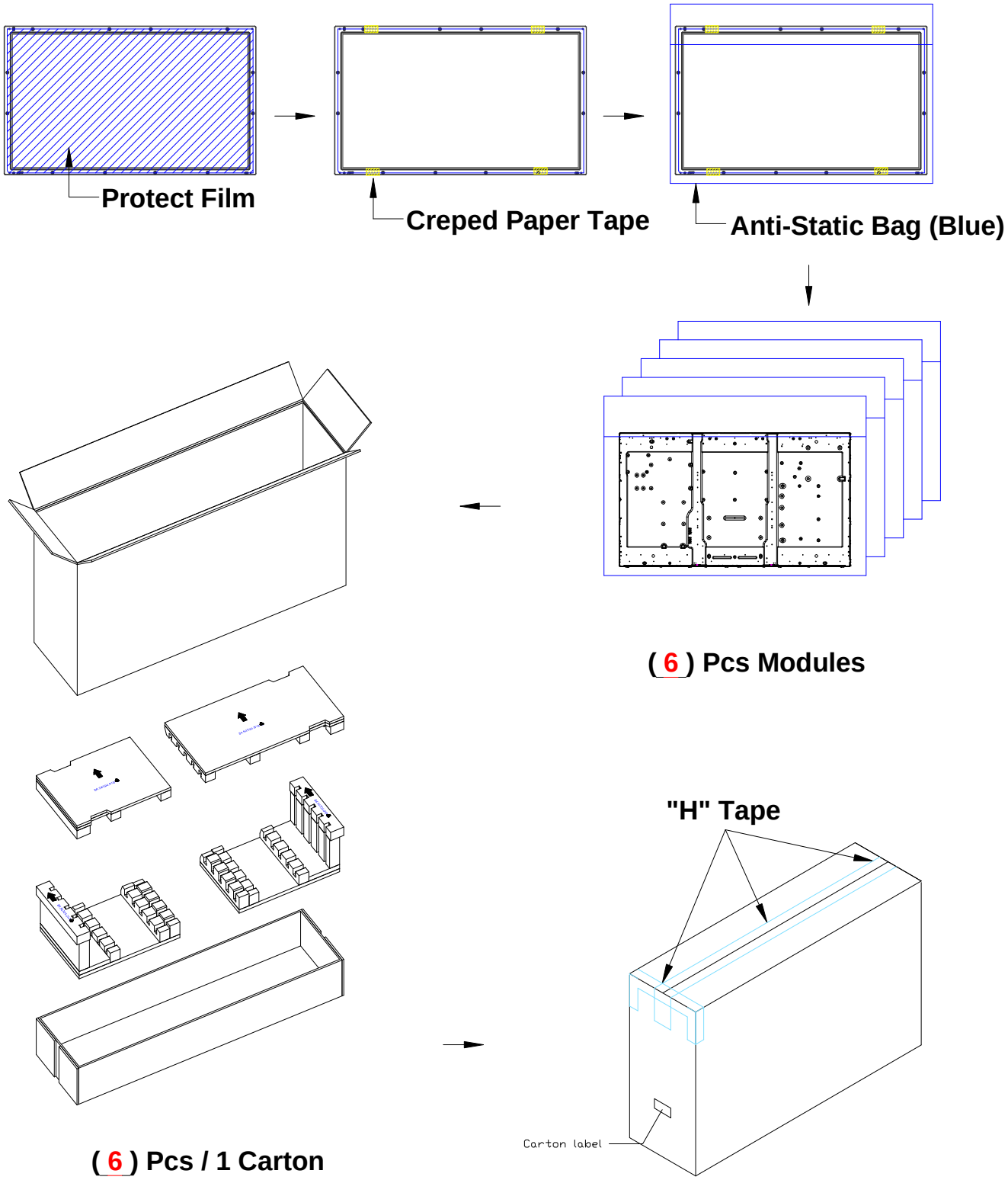
(2) For RoHs compatible products, AUO will add RoHS for identification.

Note: The green Mark will be present only when the green documents have been ready by AUO internal green

team. (definition of green design follows the AUO green design checklist.)

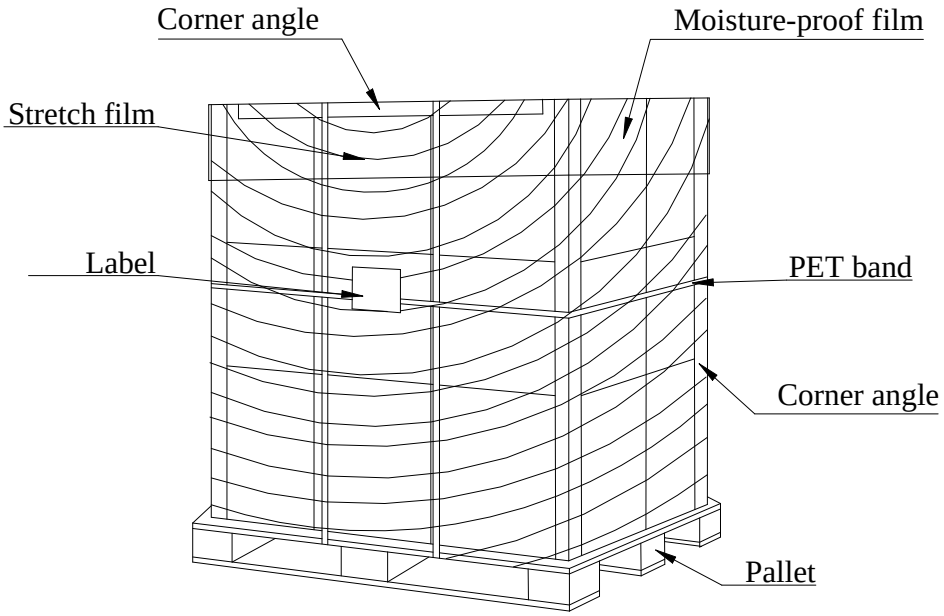
B. Carton Label:

8-2 PACKING METHODS:



8-3 Pallet and Shipment Information

	Item	Specification			Packing Remark
		Qty.	Dimension	Total Weight (kg)	Qty.
1	Packing BOX	6pcs/box	1355(L)*565(W)*806(H)	Packing BOX	6pcs/box Cushion = 3.6kg
2	Pallet	1	1390(L)*1150(W)*138(H)	Pallet	1
3	Boxes per Pallet	2 boxes/pallet			
4	Panels per Pallet	12pcs/pallet			
	Pallet after packing	32	1390(L)*1150(W)*944(H)	Pallet after packing	32



9.PRECAUTIONS

Please pay attention to the followings when you use this TFT LCD module.

9-1 MOUNTING PRECAUTIONS

(1) You must mount a module using holes arranged in four corners or four sides.

(2) You should consider the mounting structure so that uneven force (ex. twisted stress) is not applied to module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.

(3) Please attach the surface transparent protective plate to the surface in order to protect the polarizer. Transparent protective plate should have sufficient strength in order to the resist external force.

(4) You should adopt radiation structure to satisfy the temperature specification.

(5) Acetic acid type and chlorine type materials for the cover case are not desirable because the former generates corrosive gas of attacking the polarizer at high temperature and the latter cause circuit broken by electro-chemical reaction.

(6) Do not touch, push or rub the exposed polarizer with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment. Do not touch the surface of polarizer for bare hand or greasy cloth. (Some cosmetics are detrimental to the polarizer.)

(7) When the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with petroleum benzene. Normal-hexane is recommended for cleaning the adhesives used to attach front/ rear polarizer. Do not use acetone, toluene and alcohol because they cause

chemical damage to the polarizer.

(8) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.

(9) Do not open the case because inside circuits do not have sufficient strength.

9-2 OPERATING PRECAUTIONS

(1) The device listed in the product specification sheets was designed and manufactured for TV application

(2) The spike noise causes the mis-operation of circuits. It should be lower than following voltage: V=±200mV(Over and under shoot voltage)

(3) Response time depends on the temperature. (In lower temperature, it becomes longer..)

(4) Brightness of CCFL depends on the temperature. (In lower temperature, it becomes lower.) And in lower temperature, response time (required time that brightness is stable after turned on) becomes longer.

(5) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.

(6) When fixed patterns are displayed for a long time, remnant image is likely to occur.

(7) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interface.

9-3 ELECTROSTATIC DISCHARGE CONTROL

Since a module is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wristband etc. And don't touch interface pin directly.

9-4 PRECAUTIONS FOR STRONG LIGHT EXPOSURE

Strong light exposure causes degradation of polarizer and color filter.

9-5 STORAGE

When storing modules as spares for a long time, the following precautions are necessary.

(1) Store them in a dark place. Do not expose the module to sunlight or fluorescent light. Keep the temperature between 5℃ and 35℃ at normal humidity.

(2) The polarizer surface should not come in contact with any other object. It is recommended that they be stored in the container in which they were shipped.

9-6 HANDLING PRECAUTIONS FOR PROTECTION FILM

(1) The protection film is attached to the bezel with a small masking tape. When the protection film is peeled off, static electricity is generated between the film and polarizer. This should be peeled off slowly and carefully by people who are electrically grounded and with well ion-blown equipment or in such a condition, etc.

(2) When the module with protection film attached is stored for a long time, sometimes there remains a

very small amount of glue still on the bezel after the protection film is peeled off.

(3) You can remove the glue easily. When the glue remains on the bezel or its vestige is recognized, please wipe them off with absorbent cotton waste or other soft material like chamois soaked with normal-hexane.

